



09-813,279 Sequence Listing  
SEQUENCE LISTING

<110> wood, Keith

Hannah, Rita

Moravec, Richard A

<120> IMPROVED METHOD FOR DETECTION OF ATP

<130> 10743/6

<140> US 09/813,279

<141> 2001-03-19

<150> US60/269,526

<151> 2001-02-16

<160> 8

<170> PatentIn version 3.1

<210> 1

<211> 544

<212> PRT

<213> Artificial Sequence

<220>

<223> Mutant of LucPpe2 luciferase

<400> 1

Met Ala Asp Lys Asn Ile Leu Tyr Gly Pro Glu Pro Phe Tyr Pro Leu  
1 5 10 15

Ala Asp Gly Thr Ala Gly Glu Gln Met Phe Asp Ala Leu Ser Arg Tyr  
20 25 30

09-813,279 Sequence Listing

Ala Asp Ile Ser Gly Cys Ile Ala Leu Thr Asn Ala His Thr Lys Glu  
35 40 45

Asn Val Leu Tyr Glu Glu Phe Leu Lys Leu Ser Cys Arg Leu Ala Glu  
50 55 60

Ser Phe Lys Lys Tyr Gly Leu Lys Gln Asn Asp Thr Ile Ala Val Cys  
65 70 75 80

Ser Glu Asn Gly Leu Gln Phe Phe Leu Pro Val Ile Ala Ser Leu Tyr  
85 90 95

Leu Gly Ile Ile Ala Ala Pro Val Ser Asp Lys Tyr Ile Glu Arg Glu  
100 105 110

Leu Ile His Ser Leu Gly Ile Val Lys Pro Arg Ile Ile Phe Cys Ser  
115 120 125

Lys Asn Thr Phe Gln Lys Val Leu Asn Val Lys Ser Lys Leu Lys Ser  
130 135 140

Val Glu Thr Ile Ile Leu Asp Leu Asn Glu Asp Leu Gly Gly Tyr  
145 150 155 160

Gln Cys Leu Asn Asn Phe Ile Ser Gln Asn Ser Asp Ser Asn Leu Asp  
165 170 175

Val Lys Lys Phe Lys Pro Tyr Ser Phe Asn Arg Asp Asp Gln Val Ala  
180 185 190

Leu Val Met Phe Ser Ser Gly Thr Thr Gly Val Pro Lys Gly Val Met  
195 200 205

Leu Thr His Lys Asn Ile Val Ala Arg Phe Ser Leu Ala Lys Asp Pro  
210 215 220

Thr Phe Gly Asn Ala Ile Asn Pro Thr Thr Ala Ile Leu Thr Val Ile  
225 230 235 240

Pro Phe His His Gly Phe Gly Met Met Thr Thr Leu Gly Tyr Phe Thr  
245 250 255

Cys Gly Phe Arg Val Val Leu Met His Thr Phe Glu Glu Lys Leu Phe  
260 265 270

Leu Gln Ser Leu Gln Asp Tyr Lys Val Glu Ser Thr Leu Leu Val Pro  
275 280 285

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Thr Leu Met Ala Phe Leu Ala Lys Ser Ala Leu Val Glu Lys Tyr Asp  
290 295 300

Leu Ser His Leu Lys Glu Ile Ala Ser Gly Gly Ala Pro Leu Ser Lys  
305 310 315 320

Glu Ile Gly Glu Met Val Lys Lys Arg Phe Lys Leu Asn Phe Val Arg  
325 330 335

Gln Gly Tyr Gly Leu Thr Glu Thr Ser Ala Val Leu Ile Thr Pro  
340 345 350

Lys Gly Asp Ala Arg Pro Gly Ser Thr Gly Lys Ile Val Pro Phe His  
355 360 365

Ala Val Lys Val Val Asp Pro Thr Thr Gly Lys Ile Leu Gly Pro Asn  
370 375 380

Glu Pro Gly Glu Leu Tyr Phe Lys Gly Ala Met Ile Met Lys Gly Tyr  
385 390 395 400

Tyr Asn Asn Glu Glu Ala Thr Lys Ala Ile Ile Asp Asn Asp Gly Trp  
405 410 415

Leu Arg Ser Gly Asp Ile Ala Tyr Tyr Asp Asn Asp Gly His Phe Tyr  
420 425 430

Ile Val Asp Arg Leu Lys Ser Leu Ile Lys Tyr Lys Gly Tyr Gln Val  
435 440 445

Ala Pro Ala Glu Ile Glu Gly Ile Leu Leu Gln His Pro Tyr Ile Val  
450 455 460

Asp Ala Gly Val Thr Gly Ile Pro Asp Glu Ala Ala Gly Glu Leu Pro  
465 470 475 480

Ala Ala Gly Val Val Val Gln Thr Gly Lys Tyr Leu Asn Glu Gln Ile  
485 490 495

Val Gln Asp Phe Val Ser Ser Gln Val Ser Thr Ala Lys Trp Leu Arg  
500 505 510

Gly Gly Val Lys Phe Leu Asp Glu Ile Pro Lys Gly Ser Thr Gly Lys  
515 520 525

Ile Asp Arg Lys Val Leu Arg Gln Met Phe Glu Lys His Thr Asn Gly

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09-813,279 Sequence Listing  
535 540

<210> 2  
<211> 544  
<212> PRT  
<213> Artificial Sequence

<220>

<223> Mutant of LucPpe2 luciferase

<400> 2

Met Ala Asp Lys Asn Ile Leu Tyr Gly Pro Glu Pro Phe Tyr Pro Leu  
1 5 10 15

Glu Asp Gly Thr Ala Gly Glu Gln Met Phe Asp Ala Leu Ser Arg Tyr  
20 25 30

Ala Asp Ile Pro Gly Cys Ile Ala Leu Thr Asn Ala His Thr Lys Glu  
35 40 45

Asn Val Leu Tyr Glu Glu Phe Leu Lys Leu Ser Cys Arg Leu Ala Glu  
50 55 60

Ser Phe Lys Lys Tyr Gly Leu Lys Gln Asn Asp Thr Ile Ala Val Cys  
65 70 75 80

Ser Glu Asn Gly Leu Gln Phe Phe Leu Pro Val Ile Ala Ser Leu Tyr  
85 90 95

Leu Gly Ile Ile Val Ala Pro Val Asn Asp Lys Tyr Ile Glu Arg Glu  
100 105 110

Leu Ile His Ser Leu Gly Ile Val Lys Pro Arg Ile Val Phe Cys Ser  
115 120 125

Lys Asn Thr Phe Gln Lys Val Leu Asn Val Lys Ser Lys Leu Lys Ser  
130 135 140

Ile Glu Thr Ile Ile Ile Leu Asp Leu Asn Glu Asp Leu Gly Gly Tyr  
145 150 155 160

Gln Cys Leu Asn Asn Phe Ile Ser Gln Asn Ser Asp Ser Asn Leu Asp  
165 170 175

## 09-813,279 Sequence Listing

Val Lys Lys Phe Lys Pro Tyr Ser Phe Asn Arg Asp Asp Gln Val Ala  
180 185 190

Leu Ile Met Phe Ser Ser Gly Thr Thr Gly Leu Pro Lys Gly Val Met  
195 200 205

Leu Thr His Lys Asn Ile Val Ala Arg Phe Ser Leu Ala Lys Asp Pro  
210 215 220

Thr Phe Gly Asn Ala Ile Asn Pro Thr Thr Ala Ile Leu Thr Val Ile  
225 230 235 240

Pro Phe His His Gly Phe Gly Met Met Thr Thr Leu Gly Tyr Phe Thr  
245 250 255

Cys Gly Phe Arg Val Val Leu Met His Thr Phe Glu Glu Lys Leu Phe  
260 265 270

Leu Gln Ser Leu Gln Asp Tyr Lys Val Glu Ser Thr Leu Leu Val Pro  
275 280 285

Thr Leu Met Ala Phe Leu Ala Lys Ser Ala Leu Val Glu Lys Tyr Asp  
290 295 300

Leu Ser His Leu Lys Glu Ile Ala Ser Gly Gly Ala Pro Leu Ser Lys  
305 310 315 320

Glu Ile Gly Glu Met Val Lys Lys Arg Phe Lys Leu Asn Phe Val Arg  
325 330 335

Gln Gly Tyr Gly Leu Thr Glu Thr Thr Ser Ala Val Leu Ile Thr Pro  
340 345 350

Lys Gly Asp Ala Lys Pro Gly Ser Thr Gly Lys Ile Val Pro Phe His  
355 360 365

Ala Val Lys Val Val Asp Pro Thr Thr Gly Lys Ile Leu Gly Pro Asn  
370 375 380

Glu Pro Gly Glu Leu Tyr Phe Lys Gly Pro Met Ile Met Lys Gly Tyr  
385 390 395 400

Tyr Asn Asn Glu Glu Ala Thr Lys Ala Ile Ile Asp Asn Asp Gly Trp  
405 410 415

Leu Arg Ser Gly Asp Ile Ala Tyr Tyr Asp Asn Asp Gly His Phe Tyr  
420 425 430

09-813,279 Sequence Listing

Ile Val Asp Arg Leu Lys Ser Leu Ile Lys Tyr Lys Gly Tyr Gln Val  
435 440 445

Ala Pro Ala Glu Ile Glu Gly Ile Leu Leu Gln His Pro Tyr Ile Val  
450 455 460

Asp Ala Gly Val Thr Gly Ile Pro Asp Glu Ala Ala Gly Glu Leu Pro  
465 470 475 480

Ala Ala Gly Val Val Val Gln Thr Gly Lys Tyr Leu Asn Glu Gln Ile  
485 490 495

Val Gln Asp Tyr Val Ala Ser Gln Val Ser Thr Ala Lys Trp Leu Arg  
500 505 510

Gly Gly Val Lys Phe Leu Asp Glu Ile Pro Lys Gly Ser Thr Gly Lys  
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Ile Asp Arg Lys Val Leu Arg Gln Met Phe Glu Lys His Thr Asn Gly  
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<210> 3

<211> 544

<212> PRT

<213> Artificial sequence

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<223> Mutant of LucPpe2 luciferase

<400> 3

Met Ala Asp Lys Asn Ile Leu Tyr Gly Pro Glu Pro Phe Tyr Pro Leu  
1 5 10 15

Glu Asp Gly Thr Ala Gly Glu Gln Met Phe Asp Ala Leu Ser Arg Tyr  
20 25 30

Ala Asp Ile Pro Gly Cys Ile Ala Leu Thr Asn Ala His Thr Lys Glu  
35 40 45

Asn Val Leu Tyr Glu Glu Phe Leu Lys Leu Ser Cys Arg Leu Ala Glu  
50 55 60

Ser Phe Lys Lys Tyr Gly Leu Lys Gln Asn Asp Thr Ile Ala Val Cys  
65 70 75 80

09-813,279 Sequence Listing

Ser Glu Asn Ser Leu Gln Phe Phe Leu Pro Val Ile Ala Ser Leu Tyr  
85 90 95

Leu Gly Ile Ile Val Ala Pro Val Asn Asp Lys Tyr Ile Glu Arg Glu  
100 105 110

Leu Ile His Ser Leu Gly Ile Val Lys Pro Arg Ile Val Phe Cys Ser  
115 120 125

Lys Asn Thr Phe Gln Lys Val Leu Asn Val Lys Ser Lys Leu Lys Ser  
130 135 140

Ile Glu Thr Ile Ile Ile Leu Asp Leu Asn Asp Asp Leu Gly Gly Tyr  
145 150 155 160

Gln Cys Leu Asn Asn Phe Ile Ser Gln Asn Ser Asp Ser Asn Leu Asp  
165 170 175

Val Lys Lys Phe Lys Pro Tyr Ser Phe Asn Arg Asp Asp Gln Val Ala  
180 185 190

Leu Ile Met Phe Ser Ser Gly Thr Thr Gly Leu Pro Lys Gly Val Met  
195 200 205

Leu Thr His Lys Asn Ile Val Ala Arg Phe Ser Ile Ala Lys Asp Pro  
210 215 220

Thr Phe Gly Asn Ala Ile Asn Pro Thr Ser Ala Ile Leu Thr Val Ile  
225 230 235 240

Pro Phe His His Gly Phe Gly Met Met Thr Thr Leu Gly Tyr Phe Thr  
245 250 255

Cys Gly Phe Arg Val Val Leu Met His Thr Phe Glu Glu Lys Leu Phe  
260 265 270

Leu Gln Ser Leu Gln Asp Tyr Lys Val Glu Ser Thr Leu Leu Val Pro  
275 280 285

Thr Leu Met Ala Phe Leu Ala Lys Ser Ala Leu Val Glu Lys Tyr Asp  
290 295 300

Leu Ser His Leu Lys Glu Ile Ala Ser Gly Gly Ala Pro Leu Ser Lys  
305 310 315 320

Glu Ile Gly Glu Met Val Lys Lys Arg Phe Lys Leu Asn Phe Val Arg

Gln Gly Tyr Gly Leu Thr Glu Thr Thr Ser Ala Val Leu Ile Thr Pro  
340 345 350

Lys Gly Asp Ala Lys Pro Gly Ser Thr Gly Lys Ile Val Pro Phe His  
355 360 365

Ala Val Lys Val Val Asp Pro Thr Thr Gly Lys Ile Leu Gly Pro Asn  
370 375 380

Glu Pro Gly Glu Leu Tyr Phe Lys Gly Pro Met Ile Met Lys Gly Tyr  
385 390 395 400

Tyr Asn Asn Glu Glu Ala Thr Lys Ala Ile Ile Asp Asn Asp Gly Trp  
405 410 415

Leu Arg Ser Gly Asp Ile Ala Tyr Tyr Asp Asn Asp Gly His Phe Tyr  
420 425 430

Ile Val Asp Arg Leu Lys Ser Leu Ile Lys Tyr Lys Gly Tyr Gln Val  
435 440 445

Ala Pro Ala Glu Ile Glu Gly Ile Leu Leu Gln His Pro Tyr Ile Val  
450 455 460

Asp Ala Gly Val Thr Gly Ile Pro Asp Glu Ala Ala Gly Glu Leu Pro  
465 470 475 480

Ala Ala Gly Val Val Val Gln Thr Gly Lys Tyr Leu Asn Glu Gln Ile  
485 490 495

Val Gln Asp Tyr Val Ala Ser Gln Val Ser Thr Ala Lys Trp Leu Arg  
500 505 510

Gly Gly Val Ile Phe Leu Asp Glu Ile Pro Lys Gly Ser Thr Gly Lys  
515 520 525

Ile Asp Arg Lys Val Leu Arg Gln Met Leu Glu Lys His Thr Asn Gly  
530 535 540

<210> 4

<211> 544

<212> PRT

<213> Artificial Sequence

09-813,279 Sequence Listing

<220>

<223> Mutant of LucPpe2 luciferase

<400> 4

Met Ala Asp Lys Asn Ile Leu Tyr Gly Pro Glu Pro Phe Tyr Pro Leu  
1 5 10 15

Glu Asp Gly Thr Ala Gly Glu Gln Met Phe Asp Ala Leu Ser Arg Tyr  
20 25 30

Ala Ala Ile Pro Gly Cys Ile Ala Leu Thr Asn Ala His Thr Lys Glu  
35 40 45

Asn Val Leu Tyr Glu Glu Phe Leu Lys Leu Ser Cys Arg Leu Ala Glu  
50 55 60

Ser Phe Lys Lys Tyr Gly Leu Lys Gln Asn Asp Thr Ile Ala Val Cys  
65 70 75 80

Ser Glu Asn Ser Leu Gln Phe Phe Leu Pro Val Ile Ala Ser Leu Tyr  
85 90 95

Leu Gly Ile Ile Val Ala Pro Val Asn Asp Lys Tyr Ile Glu Arg Glu  
100 105 110

Leu Ile His Ser Leu Gly Ile Val Lys Pro Arg Ile Val Phe Cys Ser  
115 120 125

Lys Asn Thr Phe Gln Lys Val Leu Asn Val Lys Ser Lys Leu Lys Ser  
130 135 140

Ile Glu Thr Ile Ile Ile Leu Asp Leu Asn Glu Asp Leu Gly Gly Tyr  
145 150 155 160

Gln Cys Leu Asn Asn Phe Ile Ser Gln Asn Ser Asp Ser Asn Leu Asp  
165 170 175

Val Lys Lys Phe Lys Pro Tyr Ser Phe Asn Arg Asp Asp Gln Val Ala  
180 185 190

Ser Ile Met Phe Ser Ser Gly Thr Thr Gly Leu Pro Lys Gly Val Met  
195 200 205

Leu Thr His Lys Asn Ile Val Ala Arg Phe Ser Ile Ala Lys Asp Pro  
210 215 220

09-813,279 Sequence Listing

Thr Phe Gly Asn Ala Ile Asn Pro Thr Ser Ala Ile Leu Thr Val Ile  
225 230 235 240

Pro Phe His His Gly Phe Gly Met Met Thr Thr Leu Gly Tyr Phe Thr  
245 250 255

Cys Gly Phe Arg Val Val Leu Met His Thr Phe Glu Glu Lys Leu Phe  
260 265 270

Leu Gln Ser Leu Gln Asp Tyr Lys Val Glu Ser Thr Leu Leu Val Pro  
275 280 285

Thr Leu Met Ala Phe Leu Ala Lys Ser Ala Leu Val Glu Lys Tyr Asp  
290 295 300

Leu Ser His Leu Lys Glu Ile Ala Ser Gly Gly Ala Pro Leu Ser Lys  
305 310 315 320

Glu Ile Gly Glu Met Val Lys Lys Arg Phe Lys Leu Asn Phe Val Arg  
325 330 335

Gln Gly Tyr Gly Leu Thr Glu Thr Thr Ser Ala Val Leu Ile Thr Pro  
340 345 350

Lys Gly Asp Ala Lys Pro Gly Ser Thr Gly Lys Ile Val Pro Leu His  
355 360 365

Ala Val Lys Val Val Asp Pro Thr Thr Gly Lys Ile Leu Gly Pro Asn  
370 375 380

Glu Pro Gly Glu Leu Tyr Phe Lys Gly Pro Met Ile Met Lys Gly Tyr  
385 390 395 400

Tyr Asn Asn Glu Glu Ala Thr Lys Ala Ile Ile Asp Asn Asp Gly Trp  
405 410 415

Leu Arg Ser Gly Asp Ile Ala Tyr Tyr Asp Asn Asp Gly His Phe Tyr  
420 425 430

Ile Val Asp Arg Leu Lys Ser Leu Ile Lys Tyr Lys Gly Tyr Gln Val  
435 440 445

Ala Pro Ala Glu Ile Glu Gly Ile Leu Leu Gln His Pro Tyr Ile Val  
450 455 460

Asp Ala Gly Val Thr Gly Ile Pro Asp Glu Ala Ala Gly Glu Leu Pro  
465 470 475 480

09-813,279 Sequence Listing

Ala Ala Gly Val Val Val Gln Thr Gly Lys Tyr Leu Asn Glu Gln Ile  
485 490 495

Val Gln Asp Tyr Val Ala Ser Gln Val Ser Thr Ala Lys Trp Leu Arg  
500 505 510

Gly Gly Val Lys Phe Leu Asp Glu Ile Pro Lys Gly Ser Thr Gly Lys  
515 520 525

Ile Asp Arg Lys Val Leu Arg Gln Met Leu Glu Lys His Thr Asn Gly  
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<211> 1639

<212> DNA

<213> Artificial Sequence

<220>

<223> Mutant of LucPpe2 luciferase

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catagcattg	acaaatgctc	ataaaaaaga	aaatgtttt	tatgaagagt	ttttaaaatt	180
gtcgtgtcgt	ttagcggaaa	gtttaaaaaa	gtatggatta	aaacaaaacg	acacaatagc	240
ggtgtgttagc	gaaaatggtt	tgcaattttt	ctttcctgta	attgcatcat	tgtatcttgg	300
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tggtacaact	ggtgttccga	agggagtcat	gctaactcac	aagaatattg	ttgcacgatt	660
ttctcttgca	aaagatccta	cttttggtaa	cgcaattaat	cccacgacag	caattttaac	720
ggtaataacct	ttccaccatg	gttttggtat	gatgaccaca	ttaggatact	ttacttgg	780
attccgagtt	gttctaattgc	acacgttga	agaaaaacta	tttctacaat	cattacaaga	840
ttataaaagtg	gaaagtactt	tacttgtacc	aacattaatg	gcatttcttg	caaaaagtgc	900

## 09-813,279 Sequence Listing

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gtatggatta acagaaacca cttcggtgt tttaattaca ccgaaaggtg acgccagacc	1080
gggatcaact ggtaaaatag taccattca cgctgtaaa gttgtcgatc ctacaacagg	1140
aaaaattttg gggccaaatg aacctggaga attgtatTTT aaaggcgcca tgataatgaa	1200
gggttattat aataatgaag aagctactaa agcaattatt gataatgacg gatggttgcg	1260
ctctggtgat attgcttatt atgacaatga tggccatttt tatattgtgg acaggctgaa	1320
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acaacatccg tatattgttg atgcccgt tactggtata ccggatgaag ccgcggcga	1440
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agattttgtt tccagtcaag tttcaacagc caaatggcta cgtgggggg tgaaatTTT	1560
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tgaaaaaacac accaatggg	1639

&lt;210&gt; 6

&lt;211&gt; 1639

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Mutant of LucPpe2 luciferase

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catagcattt acaaattgtc atacaaaaga aaatgtttt tatgaagagt ttctgaaact	180
gtcgtgtcg tttagcgaaa gtttaaaaaa gtatggatta aaacaaaacg acacaatagc	240
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aataattgtg gcacctgtt acgataaata cattgaacgt gaattaatac acagtcttgg	360
tattgtaaaa ccacgcatag tttttgttc caagaatact tttcaaaaag tactgaatgt	420
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agtttatcaa tgcctcaaca actttatttc tcaaaattcc gatagtaatc tggacgtaaa	540
aaaatctaaa ccatattctt ttaatcgaga cgatcagggtt gcgttgatta tttttttttc	600
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09-813,279 Sequence Listing

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ggtaataacct ttccaccatg gtttggtat gatgaccaca ttaggatact ttacttgtgg	780
attccgagtt gttctaattgc acacgttga agaaaaacta tttctacaat cattacaaga	840
ttataaaagtg gaaagtactt tacttgtacc aacattaatg gcatttcttg caaaaagtgc	900
attagttgaa aagtacgatt tatcgcactt aaaagaaatt gcatctggtg ggcacccccc	960
atcaaaaagaa attggggaga tggtaaaaaa acggttaaa ttaaactttg tcaggcaagg	1020
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acaacatccg tatattgttg atgcggcgt tactggtata ccggatgaag ccgcggcga	1440
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agattatgtt gccagtcaag tttcaacagc caaatggcta cgtgggggg tgaaattttt	1560
ggatgaaatt cccaaaggat caactggaaa aattgacaga aaagtgttaa gacaaatgtt	1620
tgaaaaacac accaatggg	1639

<210> 7

<211> 1639

<212> DNA

<213> Artificial Sequence

<220>

<223> Mutant of LucPpe2 luciferase

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catagcatttgc acaaattgtc atacaaaaga aaatgtttt tatgaagagt ttctgaaact	180
gtcgtgtcgat ttagcggaaa gttttaaaaa gatggatta aaacaaaacg acacaatagc	240
ggtgtgttagc gaaaatagtc tgcaattttt cttcctgtat attgcattat tttatcttgg	300
aataattgtg gcacctgtta acgataaata cattgaacgt gaattaatac acagtcttgg	360

09-813,279 Sequence Listing

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attagtgaa aagtacgatt tatgcactt aaaagaaaatt gcatctggtg ggcgcaccttt 960  
atcaaaagaa attggggaga tggtaaaaaa acggtttaaa ttaaactttg tcaggcaagg 1020  
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aaaaattttg gggccaaatg aacctggaga attgtatTTT aaaggcccga tgataatgaa 1200  
gggttattat aataatgaag aagctactaa agcaattatt gataatgacg gatggttgc 1260  
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agattatgtt gccagtcag tttcaacagc caaatggcta cgtgggggg tgatatttt 1560  
ggatgaaatt cccaaaggat caactggaaa aattgacaga aaagtgttaa gacaaatgtt 1620  
agaaaaaacac accaatggg 1639

<210> 8

<211> 1639

<212> DNA

<213> Artificial Sequence

<220>

<223> Mutant of LucPpe2 luciferase

<400> 8

ggatccaatg gcagataaga atatttata tgggcccgaa ccattttatc ccttggaga 60  
tgggacggct ggagaacaga ttttgacgc attatctcgat tatgcagcta ttccgggctg 120

## 09-813,279 Sequence Listing

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attagttgaa aagtacgatt tatgcactt aaaagaaatt gcatttgcatttgc 960  
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